

WHAT IS CLAIMED IS:

1. A fully enclosed type motor with outer fans,  
comprising:

a stator core;

5 a rotor core disposed on an inner peripheral side  
of the stator core;

a first bearing provided at one end of the stator  
core via a bracket;

10 a second bearing provided at the other end of the  
stator core via a housing that is attached to the  
bracket by means of a fixing member;

a rotor shaft to which the rotor core is attached,  
the rotor shaft being rotatably supported by the first  
and second bearings;

15 a ventilation passage formed in an outer  
peripheral part of the stator core;

an external heat exchanger;

first and second blades provided on the rotor  
shaft;

20 an air passage including the first blades, an  
opening formed in the bracket, and a cooling hole  
formed in the outer peripheral part of the stator core;  
and

25 an internal circulation air passage including the  
second blades and the external heat exchanger.

2. The fully enclosed type motor with outer fans,  
according to claim 1, wherein a space communicating

with outside air is provided at the housing in a vicinity of the bearing.

3. The fully enclosed type motor with outer fans, according to claim 1, wherein a space is provided at the housing in a vicinity of the bearing by a member that is different from the housing and is detachably attached to the housing as a cover-like member.

4. The fully enclosed type motor with outer fans, according to claim 1, wherein a fan having blades on the bearing side is provided on a rotary member including at least a rotor, a region is formed to be surrounded by a main plate of the fan, at least the bracket or a frame, and the housing, an air inlet is formed at a portion having a less radial distance than the blades, an air outlet is formed at a portion having a greater radial distance than the blades, and outside air is introduced in and exhausted from the surrounded region.

5. The fully enclosed type motor with outer fans, according to claim 1, wherein a bent-shaped labyrinth is provided between a main plate of a ventilation fan and a fixed member opposed to the main plate of the ventilation fan, and the labyrinth is configured such that a gap between a radially outside portion of the ventilation fan and a radially inside portion of the fixed member, which is opposed to the radially outside portion of the ventilation fan, is greater than a gap

between a radially inside portion of the ventilation fan and a radially outside portion of the fixed member, which is opposed to the radially inside portion of the ventilation fan.

5           6. The fully enclosed type motor with outer fans, according to claim 1, wherein the cooling hole formed in the outer peripheral part of the stator core is partly exposed to outside air prior to discharge of air.

10           7. The fully enclosed type motor with outer fans, according to claim 1, wherein a projection is provided within the cooling hole formed in the stator core.

            8. The fully enclosed type motor with outer fans, according to claim 1, wherein the cooling hole formed  
15 in the stator core is defined by at least a connecting plate and a cover.

            9. The fully enclosed type motor with outer fans, according to claim 1, wherein the ventilation fan has an irregular pitch of blades.

20           10. The fully enclosed type motor with outer fans, according to claim 1, wherein the ventilation fan is constituted by combining blades with different dimensions.

            11. The fully enclosed type motor with outer fans,  
25 according to claim 1, wherein part of air fed from the first blades of the ventilation fan as cooling air is discharged to an outside from a core holder or a

connecting bracket, and the discharged cooling air is brought in contact with an outer surface of the heat exchanger.

5        12. The fully enclosed type motor with outer fans, according to claim 1, wherein a connecting bracket or a fixed bracket is formed of a material, such as aluminum, which is the same as a material of the ventilation fan.

10       13. The fully enclosed type motor with outer fans, according to claim 1, wherein a hole opened in a fixed bracket in a region where air is discharged through the cooling hole in the stator core is defined to combine a plurality of cooling holes and is made longer than a cooling cross-sectional hole in a rotational-axis  
15       direction.

14. The fully enclosed type motor with outer fans, according to claim 1, wherein a labyrinth is provided between a fan main plate of the ventilation fan and the bracket.

20       15. The fully enclosed type motor with outer fans, according to claim 1, wherein a labyrinth is provided between a main plate of the fan and the housing.

25       16. The fully enclosed type motor with outer fans, according to claim 1, wherein the ventilation fan includes blades with long axial length and short axial length.

17. The fully enclosed type motor with outer fans,

according to claim 1, wherein a projecting fin, which is radially extending like the blades of the ventilation fin, is provided on a main plate of the ventilation fan between the blades.

5           18. A fully enclosed type motor with outer fans, comprising:

          a first bearing provided at one end of a stator core via a bracket;

          a second bearing provided at the other end of the  
10       stator core via a housing member;

          a rotor shaft to which the rotor core is attached, the rotor shaft being rotatably supported by the first and second bearings; and

          a ventilation fan fixed to the rotor shaft and  
15       having a first blade formed on the bracket side and a second blade formed on the rotor core side.

          19. The fully enclosed type motor with outer fans, according to claim 18, further comprising a fan main plate having the first blade on the bracket side and  
20       the second blade on the rotor core side.

          20. A car motor for driving wheels that run on rails, comprising:

          a motor body;

          an air passage formed in an outer peripheral part  
25       of a stator core disposed within the motor body;

          a ventilation fan with first and second blades fixed to a rotor shaft disposed in the motor body;

an external heat exchanger disposed on a side of the motor body, which faces the rails; and

a fin provided on the external heat exchanger in parallel with a direction of running of the wheels.